

Disclosure: Application for Enabling Blind Individuals to Interpret Visual Images Through Sound-Based Line Guidance

Title:

“Guided Visual Interpretation for the Blind Using Line-Based Sound Feedback”

Abstract:

This invention discloses a tablet or phone application that enables blind individuals to interpret visual images by converting camera-captured pictures into simplified, highlighted main drawing lines. The user can interact with the highlighted lines using their finger and receive auditory feedback to guide their movements along the lines, enabling them to explore and “read” the visual content. This method provides a tactile and auditory approach to understanding images.

Technical Description:

1. Image Acquisition:

- The application accesses the device’s built-in camera to capture an image. Alternatively, the user can upload an existing image from the device’s storage.
- The app processes the image to extract the main drawing lines or contours of the image, simplifying it for tactile exploration. This is done using advanced image-processing algorithms such as edge detection.

2. Line Highlighting:

- The extracted lines are highlighted digitally and mapped onto the device’s screen for interaction.
- These lines are displayed in a tactile-friendly manner, where the screen becomes the virtual “canvas” for the blind user to explore.

3. Auditory Feedback System:

- As the user moves their finger across the screen:
- A **clear, sharp beep** indicates that the finger is directly on the highlighted line.
- A **distorted or noisy sound** occurs when the user moves off

the line.

- The **louder or noisier the sound**, the further the user's finger is from the line, providing directional guidance back to the line.

4. **Interaction and Learning:**

- The user moves their finger horizontally, following the guidance of the sharp beep to trace straight or curved lines.
- By exploring various sections of the image, they can identify and differentiate between different parts of the visual content.
- The user can repeat the process to gain a clearer mental picture of the image.

5. **Zoom Functionality:**

- The application includes a zoom feature, allowing users to magnify or minimize sections of the image to focus on finer details or simplify their exploration.

6. **Customization:**

- The sound intensity, pitch, or frequency can be adjusted to suit the user's hearing preferences.
- Sensitivity levels for finger movements and line detection can also be customized.

Applications:

- **Education:** Helping blind individuals understand visual diagrams, maps, or illustrations.
- **Art:** Enabling exploration of drawings, paintings, or designs.
- **Daily Use:** Assisting in interpreting signs, logos, or basic visual content in real-time.

Advantages:

1. **Accessibility:** Offers a unique combination of auditory feedback and tactile interaction to make visual content accessible to blind users.
2. **Ease of Use:** Intuitive feedback allows users to quickly learn how to interpret and follow lines.
3. **Portability:** Utilizes existing tablet and phone hardware, making the solution cost-effective and widely available.
4. **Adaptability:** Can be applied to various fields, from education to daily navigation.

Claims:

1. An application that processes images from a device's camera or gallery to generate simplified, highlighted drawing lines.
2. A system that provides auditory feedback in response to finger movements on a touchscreen to guide blind users along the highlighted lines.
3. A method for varying sound characteristics (sharpness, noise, and volume) to indicate proximity to the highlighted lines.
4. Integration of zoom functionality to allow detailed or broader exploration of images.
5. Customizable feedback settings to suit individual user preferences.